



# STIC Search Report

## Biotech-Chem Library

STIC Database Tracking Number: 175311

TO: Ralph J Gitomer  
Location: 3d65 / 3c18  
Art Unit: 1655  
Friday, January 20, 2006

Case Serial Number: 10/526207

From: Noble Jarrell  
Location: Biotech-Chem Library  
Rem 1B71  
Phone: 272-2556

Noble.jarrell@uspto.gov

### Search Notes

*plus 1/20*

=> b hcap

FILE 'HCAPLUS' ENTERED AT 09:54:31 ON 20 JAN 2006  
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
COPYRIGHT (C) 2006 AMERICAN CHEMICAL SOCIETY (ACS)

Copyright of the articles to which records in this database refer is held by the publishers listed in the PUBLISHER (PB) field (available for records published or updated in Chemical Abstracts after December 26, 1996), unless otherwise indicated in the original publications. The CA Lexicon is the copyrighted intellectual property of the American Chemical Society and is provided to assist you in searching databases on STN. Any dissemination, distribution, copying, or storing of this information, without the prior written consent of CAS, is strictly prohibited.

FILE COVERS 1907 - 20 Jan 2006 VOL 144 ISS 5  
FILE LAST UPDATED: 19 Jan 2006 (20060119/ED)

New CAS Information Use Policies, enter HELP USAGETERMS for details.

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d all hitstr 143 tot

L43 ANSWER 1 OF 6 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 2005:1277444 HCAPLUS  
DN 144:1330  
ED Entered STN: 06 Dec 2005  
TI Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chemicals  
IN Pompejus, Markus; Kroger, Burkhard; Schroder, Hartwig; Zelder, Oskar; Haberhauer, Gregor  
PA BASF Aktiengesellschaft, Germany  
SO U.S. Pat. Appl. Publ., 84 pp., Cont. of U.S. Ser. No. 606,740.  
CODEN: USXXCO  
DT Patent  
LA English  
IC ICM C12P-0021/06  
ICS C12P-0013/04; C07H-0021/04; C12N-0001/20; C12N-0015/74; C12N-0009/10  
INCL 435069100; 435106000; 435193000; 435252300; 435471000; 536023200  
CC 3-3 (Biochemical Genetics)  
Section cross-reference(s): 6, 7, 10, 16  
FAN.CNT 12

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	---	-----	-----	-----
PI	US2005260707	A1	20051124	2005US-0055822	20050211
	CA---2383865	AA	20010104	2000CA-2383865	20000623
	TR-200103707	T2	20020923	TR 2001-200103707	20000623
	US---6831165	B1	20041214	2000US-0602777	20000623
	ZA2002000584	A	20040816	2002ZA-0000584	20020123
	ZA2002000585	A	20040816	2002ZA-0000585	20020123
	ZA2002000645	A	20040726	2002ZA-0000645	20020124
	ZA2002000647	A	20040726	2002ZA-0000647	20020124
	ZA2002000646	A	20040813	2002ZA-0000646	20020124
	ZA2002008060	A	20031110	2002ZA-0008060	20021008
	US2005277115	A1	20051215	2003US-0454437	20030604
	US2004030116	A1	20040212	2003US-0627476	20030725
	US2004180408	A1	20040916	2004US-0781014	20040217
	US2005191733	A1	20050901	2005US-0061298	20050217
PRAI	1999US-141031P	P	19990625		
	1999US-142101P	P	19990702		
	1999DE-1031415	A	19990708		
	1999DE-1031418	A	19990708		

1999DE-1031419	A	19990708
1999DE-1031420	A	19990708
1999DE-1031424	A	19990708
1999DE-1031428	A	19990708
1999DE-1031434	A	19990708
1999DE-1031435	A	19990708
1999DE-1031443	A	19990708
1999DE-1031453	A	19990708
1999DE-1031457	A	19990708
1999DE-1031465	A	19990708
1999DE-1032125	A	19990709
1999DE-1032126	A	19990709
1999DE-1032186	A	19990709
1999DE-1032206	A	19990709
1999DE-1032227	A	19990709
1999DE-1032228	A	19990709
1999DE-1032229	A	19990709
1999DE-1032230	A	19990709
1999DE-1032922	A	19990714
1999DE-1032926	A	19990714
1999DE-1032928	A	19990714
1999DE-1033004	A	19990714
1999DE-1033005	A	19990714
1999DE-1033006	A	19990714
1999US-148613P	P	19990812
1999DE-1040764	A	19990827
1999DE-1040765	A	19990827
1999DE-1040766	A	19990827
1999DE-1040832	A	19990827
1999DE-1041378	A	19990831
1999DE-1041379	A	19990831
1999DE-1041380	A	19990831
1999DE-1041394	A	19990831
1999DE-1041396	A	19990831
1999DE-1042076	A	19990903
1999DE-1042077	A	19990903
1999DE-1042079	A	19990903
1999DE-1042086	A	19990903
1999DE-1042087	A	19990903
1999DE-1042088	A	19990903
1999DE-1042095	A	19990903
1999DE-1042124	A	19990903
1999DE-1042129	A	19990903
2000US-187970P	P	20000309
2000US-0606740	B1	20000623
1999DE-1030476	A	19990701
1999US-142691P	P	19990701
1999DE-1031412	A	19990708
1999DE-1031413	A	19990708
1999DE-1031431	A	19990708
1999DE-1031433	A	19990708
1999DE-1031454	A	19990708
1999DE-1031478	A	19990708
1999DE-1031510	A	19990708
1999DE-1031541	A	19990708
1999DE-1031562	A	19990708
1999DE-1031563	A	19990708
1999DE-1031573	A	19990708
1999DE-1031592	A	19990708
1999DE-1031632	A	19990708
1999DE-1031634	A	19990708
1999DE-1031636	A	19990708
1999DE-1032122	A	19990709
1999DE-1032124	A	19990709
1999DE-1032127	A	19990709
1999DE-1032128	A	19990709

1999DE-1032129	A	19990709
1999DE-1032130	A	19990709
1999DE-1032180	A	19990709
1999DE-1032182	A	19990709
1999DE-1032190	A	19990709
1999DE-1032191	A	19990709
1999DE-1032209	A	19990709
1999DE-1032212	A	19990709
1999DE-1032226	A	19990709
1999US-143208P	P	19990709
1999DE-1032920	A	19990714
1999DE-1032924	A	19990714
1999DE-1032927	A	19990714
1999DE-1032930	A	19990714
1999DE-1032933	A	19990714
1999DE-1032935	A	19990714
1999DE-1032973	A	19990714
1999DE-1033002	A	19990714
1999DE-1033003	A	19990714
1999US-150310P	P	19990823
1999DE-1040830	A	19990827
1999DE-1040831	A	19990827
1999DE-1040833	A	19990827
1999DE-1041390	A	19990831
1999DE-1041391	A	19990831
1999DE-1041395	A	19990831
1999US-151572P	P	19990831
1999DE-1042078	A	19990903
1999DE-1042097	A	19990903
1999DE-1042123	A	19990903
1999DE-1042125	A	19990903
2000US-0602740	A1	20000623
2000US-0602777	A1	20000623
2000US-0602787	A1	20000623
2000US-0604231	A1	20000627

## CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 2005260707	ICM	C12P-0021/06
	ICS	C12P-0013/04; C07H-0021/04; C12N-0001/20; C12N-0015/74; C12N-0009/10
	INCL	435069100; 435106000; 435193000; 435252300; 435471000; 536023200
	IPCI	C12P0021-06 [ICM,7]; C12P0013-04 [ICS,7]; C07H0021-04 [ICS,7]; C12N0001-20 [ICS,7]; C12N0015-74 [ICS,7]; C12N0009-10 [ICS,7]
	NCL	435/069.100; 435/106.000; 435/193.000; 435/252.300; 435/471.000; 536/023.200
CA---2383865	IPCI	C12N0015-31 [ICM,7]; C12P0013-08 [ICS,7]; C12N0001-21 [ICS,7]; C07K0014-34 [ICS,7]; C12N0015-61 [ICS,7]; C12Q0001-68 [ICS,7]; C12N0009-90 [ICS,7]
	ECLA	C07K014/34; C12N009/00; C12N009/18; C12N009/90
TR-200103707	IPCI	C12N0015-31 [ICM,7]; C12N0015-61 [ICS,7]; C12N0001-21 [ICS,7]; C07K0014-34 [ICS,7]; C12P0013-08 [ICS,7]; C12Q0001-68 [ICS,7]
US---6831165	IPCI	C07H0021-04 [ICM,7]; C07K0017-00 [ICS,7]; C12Q0001-68 [ICS,7]
	NCL	536/023.100; 435/006.000; 530/350.000; 536/024.300; 536/024.320; 536/024.330
	ECLA	C07K014/34; C12N009/00; C12N009/18
ZA2002000584	IPCI	C12N [ICM,7]; C07K [ICS,7]; C12P [ICS,7]; C12Q [ICS,7]
ZA2002000585	IPCI	C12N [ICM,7]; C07K [ICS,7]
ZA2002000645	IPCI	C12N [ICM,7]; C07K [ICS,7]; C12P [ICS,7]; C12Q [ICS,7]
ZA2002000647	IPCI	C12N [ICM,7]
ZA2002000646	IPCI	C12N [ICM,7]
ZA2002008060	IPCI	C12N [ICM,7]; C07K [ICS,7]; C12P [ICS,7]

US2005277115 IPCI C12Q0001-68 [ICM,7]  
 NCL 435/006.000

US2004030116 IPCI C07H0021-04 [ICM,7]  
 NCL 536/023.700  
 ECLA C07K014/34; C12N009/00; C12N009/18

US2004180408 IPCI C12Q0001-68 [ICM,7]; C12P0021-06 [ICS,7]  
 NCL 435/069.100  
 ECLA C07K014/34; C12N009/00; C12N009/18; C12N009/90

US2005191733 IPCI C12P0013-04 [ICM,7]; C07H0021-04 [ICS,7]; C12P0021-06 [ICS,7]; C12N0009-12 [ICS,7]; C12N0015-74 [ICS,7]; C12N0001-21 [ICS,7]  
 NCL 435/106.000

AB The invention provides 578 isolated nucleic acid mols., designated MP nucleic acid mols. for "metabolic pathway", which encode novel MP proteins from *Corynebacterium glutamicum*. The invention also provides antisense nucleic acid mols., recombinant expression vectors containing MP nucleic acid mols., and host cells into which the expression vectors have been introduced. The invention still further provides isolated MP proteins, mutated MP proteins, fusion proteins, antigenic peptides, and methods for the improvement of production of a desired compound from *C. glutamicum* based on genetic engineering of MP genes in this organism.

ST metabolic pathway gene protein sequence *Corynebacterium*; *fermn* *Corynebacterium* genetic engineering metabolic pathway

IT Enzymes, biological studies  
 RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses) (4''-Mycarosyl isovaleryl-CoA transferase; *Corynebacterium glutamicum* genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT Proteins  
 RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses) (APBA; *Corynebacterium glutamicum* genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT Proteins  
 RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses) (COBG; *Corynebacterium glutamicum* genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT Proteins  
 RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses) (COMA operon protein 2; *Corynebacterium glutamicum* genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT *Brevibacterium*  
*Brevibacterium healii*  
*Brevibacterium ketoglutamicum*  
*Brevibacterium ketosoreductum*  
*Brevibacterium linens*  
*Brevibacterium paraffinolyticum*  
*Corynebacterium*  
*Corynebacterium acetoacidophilum*  
*Corynebacterium acetoglutamicum*  
*Corynebacterium acetophilum*  
*Corynebacterium ammoniagenes*  
*Corynebacterium fujiokense*  
*Corynebacterium glutamicum*  
*Corynebacterium herculis*  
*Corynebacterium lactofermentum*  
*Corynebacterium nitrilophilus*  
 DNA microarray technology  
 DNA sequences  
*Escherichia coli*  
 Fermentation  
 Genetic engineering  
 Metabolic pathways

Protein sequences  
Transformation, genetic  
    (Corynebacterium glutamicum genes encoding metabolic pathway proteins  
    and their use for the production of fine chems.)  
IT Amino acids, preparation  
Aromatic compounds  
Carbohydrates, preparation  
Coenzymes  
Enzymes, preparation  
Glycols, preparation  
Lipids, preparation  
Nucleosides, preparation  
Nucleotides, preparation  
Polyketides  
Purine bases  
Pyrimidine bases  
Vitamins  
RL: BMF (Bioindustrial manufacture); BPN (Biosynthetic preparation); BIOL  
(Biological study); PREP (Preparation)  
    (Corynebacterium glutamicum genes encoding metabolic pathway proteins  
    and their use for the production of fine chems.)  
IT Gene, microbial  
Proteins  
RL: BPN (Biosynthetic preparation); BUU (Biological use, unclassified);  
PRP (Properties); BIOL (Biological study); PREP (Preparation); USES (Uses)  
    (Corynebacterium glutamicum genes encoding metabolic pathway proteins  
    and their use for the production of fine chems.)  
IT Transcription factors  
RL: BSU (Biological study, unclassified); BUU (Biological use,  
unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
    (Corynebacterium glutamicum genes encoding metabolic pathway proteins  
    and their use for the production of fine chems.)  
IT Enzymes, biological studies  
RL: BSU (Biological study, unclassified); BUU (Biological use,  
unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
    (Dimethyladenosine transferase; Corynebacterium glutamicum genes  
    encoding metabolic pathway proteins and their use for the production of  
    fine chems.)  
IT Proteins  
RL: BSU (Biological study, unclassified); BUU (Biological use,  
unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
    (HEMK; Corynebacterium glutamicum genes encoding metabolic pathway  
    proteins and their use for the production of fine chems.)  
IT Proteins  
RL: BSU (Biological study, unclassified); BUU (Biological use,  
unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
    (HISF; Corynebacterium glutamicum genes encoding metabolic pathway  
    proteins and their use for the production of fine chems.)  
IT Proteins  
RL: BSU (Biological study, unclassified); BUU (Biological use,  
unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
    (NIFS; Corynebacterium glutamicum genes encoding metabolic pathway  
    proteins and their use for the production of fine chems.)  
IT Proteins  
RL: BSU (Biological study, unclassified); BUU (Biological use,  
unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
    (RIBX; Corynebacterium glutamicum genes encoding metabolic pathway  
    proteins and their use for the production of fine chems.)  
IT Proteins  
RL: BSU (Biological study, unclassified); BUU (Biological use,  
unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
    (THIF; Corynebacterium glutamicum genes encoding metabolic pathway  
    proteins and their use for the production of fine chems.)  
IT Proteins  
RL: BSU (Biological study, unclassified); BUU (Biological use,  
unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)

(THIG; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT Proteins  
 RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses) (arginine hydroxymate resistance; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT Infection  
 (bacterial, by C. diphtheriae, diagnosis of; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT Proteins  
 RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses) (biotin synthesis BIOC; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT Corynebacterium diphtheriae  
 (diagnosis of infection by; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT Chemicals  
 (fine; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT Gene targeting  
 (gene knock-out; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT Proteins  
 RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses) (glutamate-binding; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT Proteins  
 RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses) (hemin-binding protein; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT Transport proteins  
 RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses) (lysine transporter; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT Proteins  
 RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses) (membrane, involved in amino acid metabolism; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT Diagnosis  
 (mol., of C. diphtheriae infection; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT Proteins  
 RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses) (molybdopterin biosynthesis CNX1; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT Proteins  
 RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses) (molybdopterin biosynthesis MOEA; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT Proteins  
 RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)

(molybdopterin biosynthesis MOEB; *Corynebacterium glutamicum* genes encoding metabolic pathway proteins and their use for the production of fine chems.)

- IT Proteins  
RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
(molybdopterin biosynthesis MOG; *Corynebacterium glutamicum* genes encoding metabolic pathway proteins and their use for the production of fine chems.)
- IT Proteins  
RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
(molybdopterin converting factor; *Corynebacterium glutamicum* genes encoding metabolic pathway proteins and their use for the production of fine chems.)
- IT Proteins  
RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
(molybdopterin-guanine dinucleotide biosynthesis; *Corynebacterium glutamicum* genes encoding metabolic pathway proteins and their use for the production of fine chems.)
- IT Proteins  
RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
(nifU; *Corynebacterium glutamicum* genes encoding metabolic pathway proteins and their use for the production of fine chems.)
- IT Acids, preparation  
RL: BMF (Bioindustrial manufacture); BPN (Biosynthetic preparation); BIOL (Biological study); PREP (Preparation)  
(organic; *Corynebacterium glutamicum* genes encoding metabolic pathway proteins and their use for the production of fine chems.)
- IT Genetic element  
RL: BUU (Biological use, unclassified); BIOL (Biological study); USES (Uses)  
(regulatory; *Corynebacterium glutamicum* genes encoding metabolic pathway proteins and their use for the production of fine chems.)
- IT Fatty acids, preparation  
RL: BMF (Bioindustrial manufacture); BPN (Biosynthetic preparation); BIOL (Biological study); PREP (Preparation)  
(saturated; *Corynebacterium glutamicum* genes encoding metabolic pathway proteins and their use for the production of fine chems.)
- IT Proteins  
RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
(thiamin biosynthesis THIC; *Corynebacterium glutamicum* genes encoding metabolic pathway proteins and their use for the production of fine chems.)
- IT Proteins  
RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
(thiamin biosynthesis X; *Corynebacterium glutamicum* genes encoding metabolic pathway proteins and their use for the production of fine chems.)
- IT Proteins  
RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
(trehalose-binding; *Corynebacterium glutamicum* genes encoding metabolic pathway proteins and their use for the production of fine chems.)
- IT Fatty acids, preparation  
RL: BMF (Bioindustrial manufacture); BPN (Biosynthetic preparation); BIOL (Biological study); PREP (Preparation)  
(unsatd.; *Corynebacterium glutamicum* genes encoding metabolic pathway proteins and their use for the production of fine chems.)
- IT 52-90-4P, L-Cysteine, preparation 56-40-6P, Glycine, preparation  
56-41-7P, L-Alanine, preparation 56-45-1P, L-Serine, preparation  
56-84-8P, L-Aspartic acid, preparation 56-85-9P, L-Glutamine, preparation  
56-86-0P, L-Glutamic acid, preparation 56-87-1P, L-Lysine, preparation  
60-18-4P, L-Tyrosine, preparation 61-90-5P, L-Leucine,



preparation 63-68-3P, L-Methionine, preparation 63-91-2P,  
 L-Phenylalanine, preparation 71-00-1P, L-Histidine, preparation  
 72-18-4P, L-Valine, preparation 72-19-5P, L-Threonine, preparation  
 73-22-3P, L-Tryptophan, preparation 73-32-5P, L-Isoleucine, preparation  
 74-79-3P, L-Arginine, preparation 147-85-3P, L-Proline, preparation  
 RL: BMF (Bioindustrial manufacture); BPN (Biosynthetic preparation); BIOL  
 (Biological study); PREP (Preparation)

(Corynebacterium glutamicum genes encoding metabolic pathway proteins  
 and their use for the production of fine chems.)

IT 9000-97-9, EC 2.6.1.1 9000-98-0, EC 1.2.1.11 9001-18-7, Lipoamide  
 dehydrogenase 9001-47-2, EC 3.5.1.2 9001-69-8, EC 2.1.3.3 9002-03-3,  
 EC 1.5.1.3 9012-37-7, EC 3.5.1.14 9012-49-1, EC 2.1.3.2 9012-50-4,  
 EC 2.7.2.4 9012-66-2, EC 4.2.1.10 9012-93-5, EC 4.99.1.1 9013-02-9,  
 EC 2.7.4.3 9013-81-4, EC 3.5.4.10 9014-12-4, EC 2.7.7.8 9014-27-1,  
 EC 4.2.1.13 9014-43-1, EC 2.7.4.9 9014-52-2, EC 4.2.1.20 9014-55-5,  
 EC 2.6.1.5 9015-68-3, EC 3.5.1.1 9015-83-2, EC 2.7.6.1 9016-12-0, EC  
 2.4.2.8 9023-10-3, EC 2.4.2.22 9023-16-9, EC 2.3.1.30 9023-35-2, EC  
 4.2.1.70 9023-49-8, EC 6.3.2.1 9023-53-4, EC 6.3.3.1 9023-56-7, EC  
 6.3.4.2 9023-57-8, EC 6.3.4.4 9023-58-9, EC 6.3.4.5 9023-67-0, EC  
 6.3.2.6 9023-70-5, EC 6.3.1.2 9023-97-6, EC 4.2.99.2 9024-06-0, EC  
 5.1.1.1 9024-22-0, EC 5.1.1.7 9024-34-4, EC 4.2.1.16 9024-35-5, EC  
 4.2.1.19 9024-58-2, EC 4.1.1.11 9024-62-8, EC 4.1.1.23 9024-70-8, EC  
 4.1.1.37 9024-75-3, EC 4.1.1.20 9024-85-5, EC 3.6.1.11 9024-93-5, EC  
 3.5.2.3 9024-94-6, EC 3.5.1.18 9025-05-2, EC 3.5.4.1 9025-08-5, EC  
 3.5.1.10 9025-44-9, EC 3.2.2.1 9025-45-0, EC 3.2.2.4 9025-54-1, EC  
 3.3.1.1 9025-63-2, EC 3.1.5.1 9025-72-3, E.C. 3.1.3.12 9025-73-4  
 9025-79-0, EC 3.1.3.15 9026-16-8, EC 2.8.3.6 9026-37-3, EC 2.7.7.2  
 9026-42-0, EC 2.7.1.35 9026-51-1, EC 2.7.4.6 9026-58-8, EC 2.7.1.39  
 9026-59-9, EC 2.7.4.8 9026-84-0, EC 2.7.1.15 9026-87-3, EC 1.1.1.25  
 9026-94-2, EC 4.1.2.15 9027-27-4, EC 3.5.1.6 9027-30-9, EC 4.3.1.1  
 9027-34-3, EC 4.3.2.1 9027-58-1, EC 2.7.2.8 9027-80-9, EC 2.4.2.7  
 9027-81-0, EC 4.3.2.2 9027-97-8, EC 3.5.4.9 9028-13-1, EC 1.1.1.3  
 9028-27-7, EC 1.1.1.23 9028-41-5, EC 1.1.1.36 9028-69-7 9028-78-8,  
 EC 1.1.3.8 9028-93-7, EC 1.1.1.205 9029-03-2, EC 1.3.3.1 9029-14-5,  
 EC 1.5.1.5 9029-17-8, EC 1.5.1.2 9029-22-5, EC 1.5.3.1 9029-32-7, EC  
 1.6.6.8 9029-83-8, EC 2.1.2.1 9029-88-3, EC 2.3.1.1 9029-93-0, EC  
 2.3.1.11 9030-07-3, EC 2.4.1.15 9030-24-4, EC 2.4.2.9 9030-25-5, EC  
 2.4.2.10 9030-26-6, EC 2.4.2.11 9030-40-4, EC 2.6.1.11 9030-70-0, EC  
 4.2.99.9 9030-72-2, EC 2.3.1.31 9030-90-4, EC 2.6.1.52 9030-97-1, EC  
 1.1.1.85 9030-98-2, EC 4.1.3.12 9031-01-0, Oxoglutarate semialdehyde  
 dehydrogenase 9031-02-1, Oxoglutarate dehydrogenase 9031-04-3, EC  
 3.1.1.24 9031-46-3, EC 2.4.2.17 9031-51-0, EC 2.7.1.71 9031-59-8, EC  
 4.1.3.27 9031-60-1, EC 4.1.1.48 9031-61-2 9031-82-7, EC 2.4.2.14  
 9032-01-3, EC 6.3.4.13 9032-02-4, EC 2.1.2.2 9032-03-5, EC 2.1.2.3  
 9032-04-6, EC 4.1.1.21 9032-28-4, Dihydrolipoamide succinyltransferase  
 9032-82-0, Riboflavin kinase 9032-84-2, EC 6.3.5.3 9032-98-8,  
 Amidotransferase HISH 9033-23-2 9036-23-1, Uridylate kinase  
 9037-18-7, EC 3.1.4.16 9037-41-6, Nitroreductase 9037-67-6, EC  
 2.6.1.19 9044-88-6, EC 4.2.1.51 9044-92-2, EC 1.3.1.12 9045-78-7, EC  
 4.1.3.1 9047-64-7, EC 1.17.4.1 9050-70-8, EC 1.5.99.8 9054-65-3, EC  
 2.6.1.42 9054-76-6 9054-82-4, EC 1.5.1.12 9055-59-8, E.C. 4.2.1.52  
 9055-61-2, EC 2.5.1.15 9059-03-4, EC 1.5.1.13 9059-35-2, EC 2.4.2.18  
 9067-83-8, EC 2.7.7.41 9068-23-9 9068-29-5, EC 2.1.1.14 9068-30-8,  
 EC 5.4.99.5 9068-63-7, 3'-Phosphoadenosine 5'-phosphosulfate reductase  
 9068-73-9 9074-11-7, EC 1.6.99.7 9074-91-3, EC 4.3.1.8 9075-02-9, EC  
 1.1.1.86 9075-29-0, EC 1.1.1.95 9075-82-5, EC 2.5.1.9 9076-84-0,  
 Coproporphyrinogen III oxidase 9076-87-3 9077-07-0, EC 4.6.1.4  
 9077-66-1, EC 2.7.7.42 9082-72-8, Branched-chain  $\alpha$ -keto acid  
 dehydrogenase 37205-42-8, EC 4.1.1.71 37205-49-5, EC 1.2.1.27  
 37211-74-8 37213-53-9 37233-48-0, EC 6.3.5.5 37251-00-6, EC 1.2.1.38  
 37257-14-0, EC 2.3.1.35 37259-71-5, EC 2.6.1.62 37259-75-9  
 37259-80-6, Demethylmenaquinone methyltransferase 37259-82-8, EC  
 5.3.1.24 37277-74-0, EC 2.4.2.19 37277-76-2, EC 2.4.2.21 37277-82-0,  
 EC 2.5.1.16 37278-18-5, EC 2.7.4.7 37278-21-0, EC 2.7.4.14  
 37278-23-2, EC 2.7.6.3 37289-18-2, EC 3.5.4.13 37289-19-3, EC 3.5.4.16  
 37289-22-8, EC 3.5.4.19 37289-29-5, EC 3.6.1.17 37289-46-6, EC

4.1.1.44 37290-59-8, EC 4.1.2.25 37290-89-4, EC 4.2.99.8 37290-90-7,  
 EC 4.2.99.10 37318-43-7, EC 5.3.1.16 37318-53-9, Isochorismate  
 hydroxymutase 37318-64-2, EC 6.3.3.2 37318-70-0, EC 6.3.5.1  
 37318-71-1, EC 6.3.5.2 37318-72-2, EC 6.3.5.4 37340-55-9, EC 4.2.1.75  
 39434-08-7, Quinolate synthase 50812-37-8 53986-32-6, EC 1.3.3.4  
 54596-29-1 54596-30-4 56093-17-5, EC 2.1.2.11 56214-35-8,  
 GTP cyclohydrolase II 60063-82-3,  
 1,4-Dihydroxy-2-naphthoate octaprenyltransferase 60894-21-5, EC 1.4.1.16  
 61328-42-5, EC 4.1.3.36 63363-84-8, EC 6.3.2.17 63690-89-1, EC 2.7.6.5  
 63774-48-1, EC 2.1.1.64 65589-88-0, EC 1.4.1.14 68518-07-0  
 68994-19-4, EC 3.5.4.26 69020-28-6 69553-55-5, EC 3.6.1.31  
 70457-12-4, EC 3.1.7.2 72506-70-8, EC 6.2.1.26 80146-93-6, EC 2.8.1.6  
 87683-70-3 88086-34-4 89287-46-7, 6,7-Dimethyl-8-ribityllumazine  
 synthase 95725-95-4, 2,5-Diketo-D-gluconic acid reductase 122007-88-9,  
 2-Succinyl-6-hydroxy-2,4-cyclohexadiene-1-carboxylate synthase  
 125752-76-3, EC 2.1.1.107 130961-00-1, 3,4-Dihydroxy-2-butanone  
 4-phosphate synthase 132264-33-6, 4-Amino-4-deoxychorismate lyase  
 137672-76-5, Cobinamide phosphate guanylyltransferase 137672-78-7,  
 Cobinamide kinase 137672-85-6, Cobalamin 5'-phosphate synthase  
 137672-90-3, Cobyrinic acid synthase 139639-26-2, Lipoate-protein ligase  
 162995-22-4, Precorrin-6Y methyltransferase 170780-49-1,  
 Maltooligosyltrehalose synthase 170780-50-4, Maltooligosyltrehalose  
 trehalohydrolase 189398-80-9, Lipoic acid synthetase 251991-06-7,  
 $\alpha$ -Ribazole-5'-phosphate phosphatase 455928-09-3, Trehalose  
 synthase 556053-43-1, Molybdenum cofactor-synthesizing enzyme  
 RL: BSU (Biological study, unclassified); BUU (Biological use,  
 unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (Corynebacterium glutamicum genes encoding metabolic pathway proteins  
 and their use for the production of fine chems.)

IT 275822-97-4, Ubiquinone methyltransferase  
 RL: BSU (Biological study, unclassified); BUU (Biological use,  
 unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (UBIE; Corynebacterium glutamicum genes encoding metabolic pathway  
 proteins and their use for the production of fine chems.)

IT 869825-42-3 869825-44-5 869825-46-7 869825-48-9 869825-50-3  
 869825-52-5 869825-54-7 869825-56-9 869825-58-1 869825-60-5  
 869825-62-7 869825-64-9 869825-66-1 869825-68-3 869825-70-7  
 869825-72-9 869825-74-1 869825-76-3 869825-78-5 869825-80-9  
 869825-82-1 869825-84-3 869825-86-5 869825-88-7 869825-90-1  
 869825-92-3 869825-94-5 869825-96-7 869825-98-9 869826-00-6  
 869826-02-8 869826-04-0 869826-06-2 869826-08-4 869826-10-8  
 869826-12-0 869826-14-2 869826-16-4 869826-18-6 869826-20-0  
 869826-22-2 869826-24-4 869826-26-6 869826-28-8 869826-30-2  
 869826-32-4 869826-34-6 869826-36-8 869826-38-0 869826-40-4  
 869826-42-6 869826-44-8 869826-46-0 869826-48-2 869826-50-6  
 869826-52-8 869826-54-0 869826-56-2 869826-58-4 869826-60-8  
 869826-62-0 869826-64-2 869826-66-4 869826-68-6 869826-70-0  
 869826-72-2 869826-74-4 869826-76-6 869826-78-8 869826-80-2  
 869826-82-4 869826-84-6 869826-86-8 869826-88-0 869826-90-4  
 869826-92-6 869826-94-8 869826-96-0 869826-98-2 869827-00-9  
 869827-02-1 869827-04-3 869827-06-5 869827-08-7 869827-10-1  
 869827-12-3 869827-14-5 869827-16-7 869827-18-9 869827-20-3  
 869827-22-5 869827-24-7 869827-26-9 869827-28-1 869827-30-5  
 869827-32-7 869827-34-9 869827-36-1 869827-38-3 869827-40-7  
 869827-42-9 869827-44-1 869827-46-3 869827-48-5 869827-50-9  
 869827-52-1 869827-54-3 869827-56-5 869827-58-7 869827-60-1  
 869827-62-3 869827-64-5 869827-66-7 869827-68-9 869827-70-3  
 869827-72-5 869827-74-7 869827-76-9 869827-78-1 869827-80-5  
 869827-82-7 869827-84-9 869827-86-1 869827-88-3 869827-90-7  
 869827-92-9 869827-94-1 869827-96-3 869827-98-5 869828-00-2  
 869828-02-4 869828-04-6 869828-07-9 869828-09-1 869828-11-5  
 869828-13-7 869828-15-9 869828-17-1 869828-19-3 869828-21-7  
 869828-23-9 869828-25-1 869828-27-3 869828-29-5 869828-31-9  
 869828-33-1 869828-35-3 869828-37-5 869828-39-7 869828-41-1  
 869828-43-3 869828-45-5 869828-47-7 869828-49-9 869828-51-3  
 869828-53-5 869828-55-7 869828-57-9 869828-59-1 869828-61-5

869828-63-7	869828-65-9	869828-67-1	869828-69-3	869828-71-7
869828-73-9	869828-75-1	869828-77-3	869828-79-5	869828-81-9
869828-83-1	869828-85-3	869828-87-5	869828-89-7	869828-91-1
869828-93-3	869828-95-5	869828-97-7	869828-99-9	869829-01-6
869829-03-8	869829-05-0	869829-07-2	869829-09-4	869829-11-8
869829-13-0	869829-15-2	869829-17-4	869829-19-6	869829-21-0
869829-23-2	869829-25-4	869829-27-6	869829-29-8	869829-31-2
869829-33-4	869829-35-6	869829-37-8	869829-39-0	869829-41-4
869829-43-6	869829-45-8	869829-47-0	869829-49-2	869829-51-6
869829-53-8	869829-55-0	869829-57-2	869829-59-4	869829-61-8
869829-63-0	869829-65-2	869829-67-4	869829-69-6	869829-71-0
869829-73-2	869829-75-4	869829-77-6	869829-79-8	869829-81-2
869829-83-4	869829-85-6	869829-87-8	869829-89-0	869829-91-4
869829-93-6	869829-95-8	869829-97-0	869829-99-2	869830-01-3
869830-03-5	869830-05-7	869830-07-9	869830-09-1	869830-11-5

RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (amino acid sequence; *Corynebacterium glutamicum* genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT	869830-13-7	869830-15-9	869830-17-1	869830-19-3	869830-21-7
	869830-23-9	869830-25-1	869830-27-3	869830-29-5	869830-31-9
	869830-33-1	869830-35-3	869830-37-5	869830-39-7	869830-41-1
	869830-43-3	869830-45-5	869830-47-7	869830-49-9	869830-51-3
	869830-53-5	869830-55-7	869830-57-9	869830-59-1	869830-61-5
	869830-63-7	869830-65-9	869830-67-1	869830-69-3	869830-71-7
	869830-73-9	869830-75-1	869830-77-3	869830-79-5	869830-81-9
	869830-83-1	869830-85-3	869830-87-5	869830-89-7	869830-91-1
	869830-93-3	869830-95-5	869830-97-7	869830-99-9	869831-01-6
	869831-03-8	869831-05-0	869831-07-2	869831-09-4	869831-11-8
	869831-13-0	869831-15-2	869831-17-4	869831-19-6	869831-21-0
	869831-23-2	869831-25-4	869831-27-6	869831-29-8	869831-31-2
	869831-33-4	869831-35-6	869831-37-8	869831-39-0	869831-41-4
	869831-43-6	869831-45-8	869831-47-0	869831-49-2	869831-51-6
	869831-53-8	869831-55-0	869831-57-2	869831-59-4	869831-61-8
	869831-63-0	869831-65-2	869831-67-4	869831-69-6	869831-71-0
	869831-73-2	869831-76-5	869831-78-7	869831-80-1	869831-82-3
	869831-84-5	869831-86-7	869831-88-9	869831-90-3	869831-92-5
	869831-94-7	869831-96-9	869831-98-1	869832-00-8	869832-02-0
	869832-04-2	869832-06-4	869832-08-6	869832-10-0	869832-12-2
	869832-14-4	869832-16-6	869832-18-8	869832-20-2	869832-22-4
	869832-24-6	869832-26-8	869832-28-0	869832-30-4	869832-32-6
	869832-35-9	869832-37-1	869832-39-3	869832-41-7	869832-43-9
	869832-45-1	869832-47-3	869832-49-5	869832-51-9	869832-53-1
	869832-55-3	869832-57-5	869832-59-7	869832-61-1	869832-63-3
	869832-65-5	869832-67-7	869832-69-9	869832-71-3	869832-73-5
	869832-75-7	869832-77-9	869832-79-1	869832-81-5	869832-83-7
	869832-85-9	869832-87-1	869832-89-3	869832-91-7	869832-93-9
	869832-95-1	869832-97-3	869832-99-5	869833-01-2	869833-03-4
	869833-05-6	869833-07-8	869833-09-0	869833-11-4	869833-13-6
	869833-15-8	869833-17-0	869833-19-2	869833-21-6	869833-23-8
	869833-25-0	869833-27-2	869833-29-4	869833-31-8	869833-33-0
	869833-35-2	869833-37-4	869833-39-6	869833-41-0	869833-43-2
	869833-45-4	869833-47-6	869833-49-8	869833-51-2	869833-53-4
	869833-55-6	869833-57-8	869833-59-0	869833-61-4	869833-63-6
	869833-65-8	869833-67-0	869833-69-2	869833-71-6	869833-73-8
	869833-75-0	869833-77-2	869833-79-4	869833-81-8	869833-83-0
	869833-85-2	869833-87-4	869833-89-6	869833-91-0	869833-93-2
	869833-95-4	869833-97-6	869833-99-8	869834-01-5	869834-03-7
	869834-05-9	869834-07-1	869834-09-3	869834-11-7	869834-13-9
	869834-15-1	869834-17-3	869834-19-5	869834-21-9	869834-23-1
	869834-25-3	869834-27-5	869834-29-7	869834-31-1	869834-33-3
	869834-35-5	869834-37-7	869834-39-9	869834-41-3	869834-43-5
	869834-45-7	869834-47-9	869834-49-1	869834-51-5	869834-53-7
	869834-55-9	869834-57-1	869834-59-3	869834-61-7	869834-63-9
	869834-65-1	869834-67-3	869834-69-5	869834-71-9	869834-73-1
	869834-75-3	869834-77-5	869834-79-7	869834-81-1	869834-83-3

RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (amino acid sequence; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT 869834-85-5 869834-87-7

RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (amino acid sequence; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT 9059-52-3, p-Aminobenzoate synthase

RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (component I; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT 869825-41-2 869825-43-4 869825-45-6 869825-47-8 869825-49-0  
 869825-51-4 869825-53-6 869825-55-8 869825-57-0 869825-59-2  
 869825-61-6 869825-63-8 869825-65-0 869825-67-2 869825-69-4  
 869825-71-8 869825-73-0 869825-75-2 869825-77-4 869825-79-6  
 869825-81-0 869825-83-2 869825-85-4 869825-87-6 869825-89-8  
 869825-91-2 869825-93-4 869825-95-6 869825-97-8 869825-99-0  
 869826-01-7 869826-03-9 869826-05-1 869826-07-3 869826-09-5  
 869826-11-9 869826-13-1 869826-15-3 869826-17-5 869826-19-7  
 869826-21-1 869826-23-3 869826-25-5 869826-27-7 869826-29-9  
 869826-31-3 869826-33-5 869826-35-7 869826-37-9 869826-39-1  
 869826-41-5 869826-43-7 869826-45-9 869826-47-1 869826-49-3  
 869826-51-7 869826-53-9 869826-55-1 869826-57-3 869826-59-5  
 869826-61-9 869826-63-1 869826-65-3 869826-67-5 869826-69-7  
 869826-71-1 869826-73-3 869826-75-5 869826-77-7 869826-79-9  
 869826-81-3 869826-83-5 869826-85-7 869826-87-9 869826-89-1  
 869826-91-5 869826-93-7 869826-95-9 869826-97-1 869826-99-3  
 869827-01-0 869827-03-2 869827-05-4 869827-07-6 869827-09-8  
 869827-11-2 869827-13-4 869827-15-6 869827-17-8 869827-19-0  
 869827-21-4 869827-23-6 869827-25-8 869827-27-0 869827-29-2  
 869827-31-6 869827-33-8 869827-35-0 869827-37-2 869827-39-4  
 869827-41-8 869827-43-0 869827-45-2 869827-47-4 869827-49-6  
 869827-51-0 869827-53-2 869827-55-4 869827-57-6 869827-59-8  
 869827-61-2 869827-63-4 869827-65-6 869827-67-8 869827-69-0  
 869827-71-4 869827-73-6 869827-75-8 869827-77-0 869827-79-2  
 869827-81-6 869827-83-8 869827-85-0 869827-87-2 869827-89-4  
 869827-91-8 869827-93-0 869827-95-2 869827-97-4 869827-99-6  
 869828-01-3 869828-03-5 869828-05-7 869828-08-0 869828-10-4  
 869828-12-6 869828-14-8 869828-16-0 869828-18-2 869828-20-6  
 869828-22-8 869828-24-0 869828-26-2 869828-28-4 869828-30-8  
 869828-32-0 869828-34-2 869828-36-4 869828-38-6 869828-40-0  
 869828-42-2 869828-44-4 869828-46-6 869828-48-8 869828-50-2  
 869828-52-4 869828-54-6 869828-56-8 869828-58-0 869828-60-4  
 869828-62-6 869828-64-8 869828-66-0 869828-68-2 869828-70-6  
 869828-72-8 869828-74-0 869828-76-2 869828-78-4 869828-80-8  
 869828-82-0 869828-84-2 869828-86-4 869828-88-6 869828-90-0  
 869828-92-2 869828-94-4 869828-96-6 869828-98-8 869829-00-5  
 869829-02-7 869829-04-9 869829-06-1 869829-08-3 869829-10-7  
 869829-12-9 869829-14-1 869829-16-3 869829-18-5 869829-20-9  
 869829-22-1 869829-24-3 869829-26-5 869829-28-7 869829-30-1  
 869829-32-3 869829-34-5 869829-36-7 869829-38-9 869829-40-3  
 869829-42-5 869829-44-7 869829-46-9 869829-48-1 869829-50-5  
 869829-52-7 869829-54-9 869829-56-1 869829-58-3 869829-60-7  
 869829-62-9 869829-64-1 869829-66-3 869829-68-5 869829-70-9  
 869829-72-1 869829-74-3 869829-76-5 869829-78-7 869829-80-1  
 869829-82-3 869829-84-5 869829-86-7 869829-88-9 869829-90-3  
 869829-92-5 869829-94-7 869829-96-9 869829-98-1 869830-00-2  
 869830-02-4 869830-04-6 869830-06-8 869830-08-0 869830-10-4

RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (nucleotide sequence; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT 869830-12-6 869830-14-8 869830-16-0 869830-18-2 869830-20-6

869830-22-8	869830-24-0	869830-26-2	869830-28-4	869830-30-8
869830-32-0	869830-34-2	869830-36-4	869830-38-6	869830-40-0
869830-42-2	869830-44-4	869830-46-6	869830-48-8	869830-50-2
869830-52-4	869830-54-6	869830-56-8	869830-58-0	869830-60-4
869830-62-6	869830-64-8	869830-66-0	869830-68-2	869830-70-6
869830-72-8	869830-74-0	869830-76-2	869830-78-4	869830-80-8
869830-82-0	869830-84-2	869830-86-4	869830-88-6	869830-90-0
869830-92-2	869830-94-4	869830-96-6	869830-98-8	869831-00-5
869831-02-7	869831-04-9	869831-06-1	869831-08-3	869831-10-7
869831-12-9	869831-14-1	869831-16-3	869831-18-5	869831-20-9
869831-22-1	869831-24-3	869831-26-5	869831-28-7	869831-30-1
869831-32-3	869831-34-5	869831-36-7	869831-38-9	869831-40-3
869831-42-5	869831-44-7	869831-46-9	869831-48-1	869831-50-5
869831-52-7	869831-54-9	869831-56-1	869831-58-3	869831-60-7
869831-62-9	869831-64-1	869831-66-3	869831-68-5	869831-70-9
869831-72-1	869831-74-3	869831-75-4	869831-77-6	869831-79-8
869831-81-2	869831-83-4	869831-85-6	869831-87-8	869831-89-0
869831-91-4	869831-93-6	869831-95-8	869831-97-0	869831-99-2
869832-01-9	869832-03-1	869832-05-3	869832-07-5	869832-09-7
869832-11-1	869832-13-3	869832-15-5	869832-17-7	869832-19-9
869832-21-3	869832-23-5	869832-25-7	869832-27-9	869832-29-1
869832-31-5	869832-33-7	869832-34-8	869832-36-0	869832-38-2
869832-40-6	869832-42-8	869832-44-0	869832-46-2	869832-48-4
869832-50-8	869832-52-0	869832-54-2	869832-56-4	869832-58-6
869832-60-0	869832-62-2	869832-64-4	869832-66-6	869832-68-8
869832-70-2	869832-72-4	869832-74-6	869832-76-8	869832-78-0
869832-80-4	869832-82-6	869832-84-8	869832-86-0	869832-88-2
869832-90-6	869832-92-8	869832-94-0	869832-96-2	869832-98-4
869833-00-1	869833-02-3	869833-04-5	869833-06-7	869833-08-9
869833-10-3	869833-12-5	869833-14-7	869833-16-9	869833-18-1
869833-20-5	869833-22-7	869833-24-9	869833-26-1	869833-28-3
869833-30-7	869833-32-9	869833-34-1	869833-36-3	869833-38-5
869833-40-9	869833-42-1	869833-44-3	869833-46-5	869833-48-7
869833-50-1	869833-52-3	869833-54-5	869833-56-7	869833-58-9
869833-60-3	869833-62-5	869833-64-7	869833-66-9	869833-68-1
869833-70-5	869833-72-7	869833-74-9	869833-76-1	869833-78-3
869833-80-7	869833-82-9	869833-84-1	869833-86-3	869833-88-5
869833-90-9	869833-92-1	869833-94-3	869833-96-5	869833-98-7
869834-00-4	869834-02-6	869834-04-8	869834-06-0	869834-08-2
869834-10-6	869834-12-8	869834-14-0	869834-16-2	869834-18-4
869834-20-8	869834-22-0	869834-24-2	869834-26-4	869834-28-6
869834-30-0	869834-32-2	869834-34-4	869834-36-6	869834-38-8
869834-40-2	869834-42-4	869834-44-6	869834-46-8	869834-48-0
869834-50-4	869834-52-6	869834-54-8	869834-56-0	869834-58-2
869834-60-6	869834-62-8	869834-64-0	869834-66-2	869834-68-4
869834-70-8	869834-72-0	869834-74-2	869834-76-4	869834-78-6

RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (nucleotide sequence; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT 869834-80-0 869834-82-2 869834-84-4 869834-86-6  
 RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (nucleotide sequence; Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT 869834-94-6 869834-95-7  
 RL: PRP (Properties)  
 (unclaimed nucleotide sequence; corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

IT 56214-35-8, GTP cyclohydrolase II  
 RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (Corynebacterium glutamicum genes encoding metabolic pathway proteins and their use for the production of fine chems.)

RN 56214-35-8 HCAPLUS

CN Hydrolase, guanosine triphosphate cyclo-, II (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L43 ANSWER 2 OF 6 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 2004:220483 HCAPLUS

DN 140:266730

ED Entered STN: 19 Mar 2004

TI GTP cyclohydrolase II determination using  
formate dehydrogenase and use of GTP hydrolase II in  
fungicide screening

IN Freund, Annette; Roehl, Franz; Althoefer,  
Henning; Karos, Marvin; Kaesler, Bruno;  
Lacour, Thierry

PA BASF Aktiengesellschaft, Germany

SO PCT Int. Appl., 43 pp.

CODEN: PIXXD2

DT Patent

LA English

IC ICM C12Q-0001/34

CC 7-1 (Enzymes)

Section cross-reference(s): 3, 10

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO2004022776	A2	20040318	2003WO-EP09369	20030823 <--
	WO2004022776	A3	20040708		
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
EP---	1537233	A2	20050608	2003EP-0750433	20030823 <--
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
US	2005239159	A1	20051027	2005US-0526207	20050304 <--
PRAI	2002EP-0020051	A	20020906		
	2003WO-EP09369	W	20030823	<--	

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2004022776	ICM	C12Q-0001/34
	IPCI	C12Q0001-34 [ICM,7]
	ECLA	C12N009/78; C12Q001/34; A01N043/90; A01N061/00 <--
EP---	IPCI	C12Q0001-34 [ICM,7]; C12Q0001-32 [ICS,7]; C12N0015-52 [ICS,7]; C12N0015-04 [ICS,7] <--
US2005239159	IPCI	C12Q0001-42 [ICM,7]
	NCL	435/021.000
	ECLA	A01N043/90; A01N061/00; C12N009/78; C12Q001/34 <--
AB	The present invention relates to the identification of fungal GTP cyclohydrolase II as a target for fungicides, to a method for identifying antifungal agents based on fungal GTP cyclohydrolase II, and also to the use of compds. identified as fungicides via the above-mentioned method.	
ST	sequence Ashbya Fusarium GTP cyclohydrolase II cDNA; fungicide screening GTP cyclohydrolase II detn formate dehydrogenase	
IT	Ashbya gossypii Fungicides Fusarium graminearum High throughput screening	

(GTP cyclohydrolase II determination using formate dehydrogenase and use of GTP hydrolase II in fungicide screening)

IT Fungi  
(cyclohydrolase gene-expressing; GTP cyclohydrolase II determination using formate dehydrogenase and use of GTP hydrolase II in fungicide screening)

IT Phytopathogenic fungi  
(fungicidal compds. for; GTP cyclohydrolase II determination using formate dehydrogenase and use of GTP hydrolase II in fungicide screening)

IT Soils  
(fungicides for use in; GTP cyclohydrolase II determination using formate dehydrogenase and use of GTP hydrolase II in fungicide screening)

IT Embryophyta  
Seed  
(fungicides for use on; GTP cyclohydrolase II determination using formate dehydrogenase and use of GTP hydrolase II in fungicide screening)

IT 58-68-4, NADH  
RL: ANT (Analyte); ANST (Analytical study)  
(GTP cyclohydrolase II determination using formate dehydrogenase and use of GTP hydrolase II in fungicide screening)

IT 37289-19-3, GTP cyclohydrolase I 56214-35-8, GTP cyclohydrolase II  
RL: ANT (Analyte); ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)  
(GTP cyclohydrolase II determination using formate dehydrogenase and use of GTP hydrolase II in fungicide screening)

IT 53-84-9, NAD 86-01-1, GTP 86-01-1D, GTP, analogs 9028-85-7, Formate dehydrogenase  
RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)  
(GTP cyclohydrolase II determination using formate dehydrogenase and use of GTP hydrolase II in fungicide screening)

IT 673087-29-1 673087-30-4  
RL: ANT (Analyte); ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)  
(amino acid sequence; GTP cyclohydrolase II determination using formate dehydrogenase and use of GTP hydrolase II in fungicide screening)

IT 673087-31-5 673087-32-6  
RL: ANT (Analyte); ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)  
(nucleotide sequence; GTP cyclohydrolase II determination using formate dehydrogenase and use of GTP hydrolase II in fungicide screening)

IT 673089-93-5  
RL: PRP (Properties)  
(unclaimed nucleotide sequence; GTP cyclohydrolase II determination using formate dehydrogenase and use of GTP hydrolase II in fungicide screening)

IT 56214-35-8, GTP cyclohydrolase II  
RL: ANT (Analyte); ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)  
(GTP cyclohydrolase II determination using formate dehydrogenase and use of GTP hydrolase II in fungicide screening)

RN 56214-35-8 HCAPLUS  
CN Hydrolase, guanosine triphosphate cyclo-, II (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

IT 673087-29-1 673087-30-4

RL: ANT (Analyte); ARG (Analytical reagent use); ANST (Analytical study);  
USES (Uses)

(amino acid sequence; GTP cyclohydrolase II  
determination using formate dehydrogenase and use of GTP hydrolase  
II in fungicide screening)

RN 673087-29-1 HCAPLUS

CN Hydrolase, guanosine triphosphate cyclo-, II (Ashbya gossipii) (9CI) (CA  
INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RN 673087-30-4 HCAPLUS

CN Hydrolase, guanosine triphosphate cyclo-, II (Fusarium graminearum) (9CI)  
(CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

IT 673087-31-5 673087-32-6

RL: ANT (Analyte); ARG (Analytical reagent use); ANST (Analytical study);  
USES (Uses)

(nucleotide sequence; GTP cyclohydrolase II  
determination using formate dehydrogenase and use of GTP hydrolase  
II in fungicide screening)

RN 673087-31-5 HCAPLUS

CN DNA (Fusarium graminearum guanosine triphosphate cyclohydrolase II cDNA)  
(9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RN 673087-32-6 HCAPLUS

CN DNA (Ashbya gossipii guanosine triphosphate cyclohydrolase II cDNA) (9CI)  
(CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L43 ANSWER 3 OF 6 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 2003:454498 HCAPLUS

DN 139:31827

ED Entered STN: 13 Jun 2003

TI Genes for enzymes of riboflavin biosynthesis of Ashbya and their use in  
improving yields in riboflavin fermentation

IN Althoefer, Henning; Revuelta Doval, Jose L.

PA BASF Aktiengesellschaft, Germany

SO PCT Int. Appl., 37 pp.

CODEN: PIXXD2

DT Patent

LA German

IC ICM C12N-0015/80

ICS C12P-0025/00; C12N-0015/52; C12N-0001/15

CC 3-3 (Biochemical Genetics)

Section cross-reference(s): 10, 16

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO2003048367	A1	20030612	2002WO-EP13660	20021203
	W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
	RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
	DE--10159396	A1	20030612	2001DE-1059396	20011204
	EP--1456388	A1	20040915	2002EP-0791764	20021203
	R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK			



JP2005511053	T2	20050428	2003JP-0549544	20021203
US2005239161	A1	20051027	2004US-0497526	20040603
PRAI 2001DE-1059396	A	20011204		
2002WO-EP13660	W	20021203		

## CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2003048367	ICM	C12N-0015/80
	ICS	C12P-0025/00; C12N-0015/52; C12N-0001/15
	IPCI	C12N0015-80 [ICM,7]; C12P0025-00 [ICS,7]; C12N0015-52 [ICS,7]; C12N0001-15 [ICS,7]
DE--10159396	ECLA	C12N015/80; C12P025/00
	IPCI	C12P0025-00 [ICM,7]
	ECLA	C12N015/80; C12P025/00
EP---1456388	IPCI	C12N0015-80 [ICM,7]; C12P0025-00 [ICS,7]; C12N0015-52 [ICS,7]; C12N0001-15 [ICS,7]
JP2005511053	IPCI	C12P0025-00 [ICM,7]; C12N0015-09 [ICS,7]
	FTERM	4B024/AA01; 4B024/CA02; 4B024/CA05; 4B024/DA11; 4B024/GA14; 4B064/AH02; 4B064/BH20; 4B064/CA19; 4B064/CC24; 4B064/DA01
US2005239161	IPCI	C12P0025-00; C12N0001-21
	NCL	435/066.000
AB		The rib-1, -2, -4, and -7 genes of <i>Ashbya gossypii</i> encoding the riboflavin biosynthesis enzymes GTP cyclohydrolase II, DRAP deaminase, DMRL synthase, HTP reductase are used to increase the yield of riboflavin from producer cells. Expression of extra copies of these genes in <i>Ashbya gossypii</i> LU21 increased the yield of riboflavin from .apprx.3 g/L to 3.5-4 g/L.
ST		<i>Ashbya</i> riboflavin biosynthesis gene sequence; riboflavin fermn <i>Ashbya</i> rib gene; rib1 rib2 rib4 rib7 gene <i>Ashbya</i> sequence
IT		Plasmid vectors (Tef-G418-rib1, rib1 expression vector; genes for enzymes of riboflavin biosynthesis of <i>Ashbya</i> and their use in improving yields in riboflavin fermentation)
IT		Plasmid vectors (Tef-G418-rib2, rib2 expression vector; genes for enzymes of riboflavin biosynthesis of <i>Ashbya</i> and their use in improving yields in riboflavin fermentation)
IT		Plasmid vectors (Tef-G418-rib4, rib4 expression vector; genes for enzymes of riboflavin biosynthesis of <i>Ashbya</i> and their use in improving yields in riboflavin fermentation)
IT		Plasmid vectors (Tef-G418-rib7, rib7 expression vector; genes for enzymes of riboflavin biosynthesis of <i>Ashbya</i> and their use in improving yields in riboflavin fermentation)
IT		<i>Ashbya gossypii</i> (genes for enzymes of riboflavin biosynthesis of <i>Ashbya</i> and their use in improving yields in riboflavin fermentation)
IT		Protein sequences (of products of rib-1, -2, -4, and -7 gene products of <i>Ashbya gossypii</i> ; genes for enzymes of riboflavin biosynthesis of <i>Ashbya</i> and their use in improving yields in riboflavin fermentation)
IT		DNA sequences (of rib-1, -2, -4, and -7 genes of <i>Ashbya gossypii</i> ; genes for enzymes of riboflavin biosynthesis of <i>Ashbya</i> and their use in improving yields in riboflavin fermentation)
IT		Genetic engineering (of riboflavin biosynthesis; genes for enzymes of riboflavin biosynthesis of <i>Ashbya</i> and their use in improving yields in riboflavin fermentation)
IT		Fermentation (of riboflavin; genes for enzymes of riboflavin biosynthesis of <i>Ashbya</i> and their use in improving yields in riboflavin fermentation)
IT		Gene, microbial RL: BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological

study); USES (Uses)  
 (rib1; genes for enzymes of riboflavin biosynthesis of Ashbya and their use in improving yields in riboflavin fermentation)

IT Gene, microbial  
 RL: BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (rib2; genes for enzymes of riboflavin biosynthesis of Ashbya and their use in improving yields in riboflavin fermentation)

IT Gene, microbial  
 RL: BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (rib4; genes for enzymes of riboflavin biosynthesis of Ashbya and their use in improving yields in riboflavin fermentation)

IT Gene, microbial  
 RL: BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (rib7; genes for enzymes of riboflavin biosynthesis of Ashbya and their use in improving yields in riboflavin fermentation)

IT 541556-30-3 541556-32-5 541556-33-6 541556-34-7  
 RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (amino acid sequence; genes for enzymes of riboflavin biosynthesis of Ashbya and their use in improving yields in riboflavin fermentation)

IT 83-88-5P, Riboflavin, preparation  
 RL: BPN (Biosynthetic preparation); BIOL (Biological study); PREP (Preparation)  
 (genes for enzymes of riboflavin biosynthesis of Ashbya and their use in improving yields in riboflavin fermentation)

IT 56214-35-8, GTP cyclohydrolase II  
 68651-97-8, Reductase, 2,5-diamino-6-hydroxy-4-ribosylaminopyrimidine 5'-phosphate 68994-19-4, Deaminase, diaminohydroxyphosphoribitylaminopyrimidine 89287-46-7, Synthase, 6,7-dimethyl-8-ribityllumazine  
 RL: PRP (Properties)  
 (genes for enzymes of riboflavin biosynthesis of Ashbya and their use in improving yields in riboflavin fermentation)

IT 541556-29-0 541556-31-4 541556-35-8 541556-36-9  
 RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (nucleotide sequence; genes for enzymes of riboflavin biosynthesis of Ashbya and their use in improving yields in riboflavin fermentation)

IT 541562-03-2 541562-04-3 541562-05-4 541562-06-5 541562-07-6 541562-08-7  
 RL: PRP (Properties)  
 (unclaimed nucleotide sequence; genes for enzymes of riboflavin biosynthesis of Ashbya and their use in improving yields in riboflavin fermentation)

RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE  
 (1) Althoefer, H; WO---9961623 A 1999 HCAPLUS  
 (2) Angel, S; WO---9526406 A 1995 HCAPLUS  
 (3) Hoffmann La Roche; EP---0405370 A 1991 HCAPLUS

IT 541556-30-3  
 RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (amino acid sequence; genes for enzymes of riboflavin biosynthesis of Ashbya and their use in improving yields in riboflavin fermentation)

RN 541556-30-3 HCAPLUS

CN Hydrolase, guanosine triphosphate cyclo-, II (Ashbya gossipii clone pJR765 gene rib1) (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

IT 56214-35-8, GTP cyclohydrolase II  
 RL: PRP (Properties)  
 (genes for enzymes of riboflavin biosynthesis of Ashbya and their use in improving yields in riboflavin fermentation)

RN 56214-35-8 HCAPLUS

CN Hydrolase, guanosine triphosphate cyclo-, II (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L43 ANSWER 4 OF 6 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1995:969546 HCAPLUS  
 DN 124:2552  
 ED Entered STN: 08 Dec 1995  
 TI Isolation and sequencing of riboflavin biosynthesis genes of *Ashbya gossypii* and their use in riboflavin production  
 IN Revuelta, Doval Jose Lui; Santos, Garcia Maria Angeles; Buitrago, Serna Maria Jose  
 PA BASF A.-G., Germany  
 SO Ger. Offen., 34 pp.  
 CODEN: GWXXBX  
 DT Patent  
 LA German  
 IC ICM C12N-0015/80  
 ICS C12N-0015/52; C12N-0001/15; C12N-0001/19; C12P-0025/00  
 ICI C12N-0015/81, C12R-0001/865; C12N-0015/52, C12R-0001/645; C12N-0001/19, C12R-0001/865  
 CC 3-3 (Biochemical Genetics)  
 Section cross-reference(s): 10, 16  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE---4420785	A1	19951005	1994DE-4420785	19940615
	CA---2186403	AA	19951005	1995CA-2186403	19950315
	WO---9526406	A2	19951005	1995WO-EP00958	19950315
	WO---9526406	A3	20011220		
	W: CA, CN, JP, RU, US				
	RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	EP----751995	A1	19970108	1995EP-0913119	19950315
	EP----751995	B1	20040218		
	R: BE, CH, DE, DK, ES, FR, GB, IT, NL				
	CN---1146781	A	19970402	1995CN-0192767	19950315
	CN---1117151	B	20030806		
	JP--09510618	T2	19971028	1995JP-0524932	19950315
	RU---2155229	C2	20000827	1996RU-0121465	19950315
	ES---2216010	T3	20041016	1995ES-0913119	19950315
	US---5821090	A	19981013	1996US-0716301	19960924
PRAI	1994DE-4410382	A1	19940325		
	1994DE-4420785	A	19940615		
	1995WO-EP00958	W	19950315		

# CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
DE 4420785	ICM	C12N-0015/80
	ICS	C12N-0015/52; C12N-0001/15; C12N-0001/19; C12P-0025/00
	ICI	C12N-0015/81, C12R-0001/865; C12N-0015/52, C12R-0001/645; C12N-0001/19, C12R-0001/865
	IPCI	C12N0015-80 [ICM,6]; C12N0015-52 [ICS,6]; C12N0001-15 [ICS,6]; C12N0001-19 [ICS,6]; C12P0025-00 [ICS,6]; C12N0015-81 [ICI,6]; C12R0001-865 [ICI,6]; C12N0015-52 [ICI,6]; C12R0001-645 [ICI,6]; C12N0001-19 [ICI,6]; C12R0001-865 [ICI,6]
CA---2186403	IPCI	C12N0015-52 [ICM,6]; C12N0015-53 [ICS,6]; C12N0015-54 [ICS,6]; C12N0015-55 [ICS,6]; C12P0025-00 [ICS,6]
WO---9526406	IPCI	C12N0015-52 [ICM,6]; C12N0015-53 [ICS,6]; C12N0015-54 [ICS,6]; C12N0015-55 [ICS,6]; C12N0015-81 [ICS,6]; C12N0001-19 [ICS,6]; C12P0025-00 [ICS,6]; C12N0001-19 [ICI,6]; C12R0001-865 [ICI,6]
	ECLA	C12N015/52; C12N015/80; C12P025/00
EP----751995	IPCI	C12N0015-52 [ICM,6]; C12N0015-53 [ICS,6]; C12N0015-54 [ICS,6]; C12N0015-55 [ICS,6]; C12N0015-81 [ICS,6]; C12N0001-19 [ICS,6]; C12P0025-00 [ICS,6]; C12N0001-19

[ICI,6]; C12R0001-865 [ICI,6]  
 CN---1146781 IPCI C12N0015-52 [ICM,6]; C12N0015-53 [ICS,6]; C12N0015-54 [ICS,6]; C12N0015-55 [ICS,6]; C12N0015-81 [ICS,6]; C12N0001-19 [ICS,6]; C12P0025-00 [ICS,6]  
 JP--09510618 ECLA C12N015/52; C12N015/80; C12P025/00  
 IPCI C12N0015-09 [ICM,6]; C12N0001-19 [ICS,6]; C12N0009-00 [ICS,6]; C12N0009-06 [ICS,6]; C12N0009-14 [ICS,6]; C12N0015-09 [ICS,6]; C12R0001-645 [ICS,6]; C12R0001-865 [ICS,6]  
 RU---2155229 IPCI C12N0015-52 [ICM,7]; C12N0015-53 [ICS,7]; C12N0015-54 [ICS,7]; C12N0015-55 [ICS,7]; C12N0015-81 [ICS,7]; C12N0001-19 [ICS,7]; C12P0025-00 [ICS,7]  
 ES---2216010 IPCI C12N0015-52 [ICM,7]; C12N0015-53 [ICS,7]; C12N0015-54 [ICS,7]; C12N0015-55 [ICS,7]; C12N0015-81 [ICS,7]; C12N0001-19 [ICS,7]; C12P0025-00 [ICS,7]; C12R0001-865 [ICS,7]  
 US---5821090 IPCI C07H0021-04 [ICM,6]; C12N0015-00 [ICS,6]; C12N0001-14 [ICS,6]; C12P0019-40 [ICS,6]  
 NCL 435/088.000; 435/066.000; 435/254.100; 435/254.110; 435/254.200; 435/254.210; 435/254.220; 435/320.100; 435/325.000; 536/023.200  
 ECLA C12N015/52; C12N015/80; C12P025/00  
 AB The rib-1, -2, -3, -4, -5, and -7 genes encoding riboflavin biosynthesis enzymes GTP cyclohydrolase II, DRAP deaminase, DBP synthase, DMRL synthase, riboflavin synthase, and HTP reductase are claimed. Recombinant cells expressing rib gene(s) may be used in riboflavin production  
 ST Ashbya riboflavin biosynthesis gene sequence; riboflavin fermn Ashbya rib gene  
 IT **Nematospora gossypii**  
 (isolation and sequencing of riboflavin biosynthesis genes of Ashbya gossypii and their use in riboflavin production)  
 IT Deoxyribonucleic acid sequences  
 (of rib-1, -2, -3, -4, -5, and -7 genes encoding riboflavin biosynthesis enzymes of Ashbya gossypii)  
 IT Protein sequences  
 (of rib-1, -2, -3, -4, -5, and -7 genes riboflavin biosynthesis enzymes of Ashbya gossypii)  
 IT Plasmid and Episome  
 (pJR series, rib gene expression vectors; isolation and sequencing of riboflavin biosynthesis genes of Ashbya gossypii and their use in riboflavin production)  
 IT Saccharomyces cerevisiae  
 (recombinant; isolation and sequencing of riboflavin biosynthesis genes of Ashbya gossypii and their use in riboflavin production)  
 IT Gene, microbial  
 RL: BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (rib-3; isolation and sequencing of riboflavin biosynthesis genes of Ashbya gossypii and their use in riboflavin production)  
 IT Gene, microbial  
 RL: BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (rib-4; isolation and sequencing of riboflavin biosynthesis genes of Ashbya gossypii and their use in riboflavin production)  
 IT Gene, microbial  
 RL: BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (rib-7; isolation and sequencing of riboflavin biosynthesis genes of Ashbya gossypii and their use in riboflavin production)  
 IT Gene, microbial  
 RL: BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (RIB1, isolation and sequencing of riboflavin biosynthesis genes of Ashbya gossypii and their use in riboflavin production)  
 IT Gene, microbial

RL: BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (RIB5, isolation and sequencing of riboflavin biosynthesis genes of Ashbya gossypii and their use in riboflavin production)

IT Gene, microbial  
 RL: BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (rib2, isolation and sequencing of riboflavin biosynthesis genes of Ashbya gossypii and their use in riboflavin production)

IT 171265-01-3 171265-03-5 171265-05-7 171265-07-9  
 171265-09-1 171265-11-5  
 RL: BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (amino acid sequence; isolation and sequencing of riboflavin biosynthesis genes of Ashbya gossypii and their use in riboflavin production)

IT 83-88-5P, Riboflavin, preparation  
 RL: BPN (Biosynthetic preparation); BIOL (Biological study); PREP (Preparation)  
 (isolation and sequencing of riboflavin biosynthesis genes of Ashbya gossypii and their use in riboflavin production)

IT 9075-82-5, Riboflavin synthase 56214-35-8, GTP cyclohydrolase II 68651-97-8, Reductase, 2,5-diamino-6-hydroxy-4-ribosylaminopyrimidine 5'-phosphate 68994-19-4, Deaminase, diaminohydroxyphosphoribitylaminopyrimidine 89287-46-7, Synthase, 6,7-dimethyl-8-ribityllumazine 130961-00-1  
 RL: PRP (Properties)  
 (isolation and sequencing of riboflavin biosynthesis genes of Ashbya gossypii and their use in riboflavin production)

IT 171265-00-2 171265-02-4 171265-04-6 171265-06-8 171265-08-0  
 171265-10-4  
 RL: BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (nucleotide sequence; isolation and sequencing of riboflavin biosynthesis genes of Ashbya gossypii and their use in riboflavin production)

IT 171265-01-3  
 RL: BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (amino acid sequence; isolation and sequencing of riboflavin biosynthesis genes of Ashbya gossypii and their use in riboflavin production)

RN 171265-01-3 HCAPLUS  
 CN Hydrolase, guanosine triphosphate cyclo-, II (Ashbya gossypii clone pJR765 gene rib-1) (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

IT 56214-35-8, GTP cyclohydrolase II  
 RL: PRP (Properties)  
 (isolation and sequencing of riboflavin biosynthesis genes of Ashbya gossypii and their use in riboflavin production)

RN 56214-35-8 HCAPLUS  
 CN Hydrolase, guanosine triphosphate cyclo-, II (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L43 ANSWER 5 OF 6 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1994:528758 HCAPLUS  
 DN 121:128758  
 ED Entered STN: 17 Sep 1994  
 TI Genes for the riboflavin biosynthetic enzymes of Saccharomyces cerevisiae  
 IN Revuelta Doval, Jose Luis; Sanios Garcia, M. A.; Garcia Ramirez, Jose Javier; Gonzales-Hernandez, G. A.; Buitrago Sema, M. J.  
 PA BASF A.-G., Germany  
 SO Ger. Offen., 28 pp.  
 CODEN: GWXXBX

DT Patent  
 LA German  
 IC ICM C12N-0001/19  
 ICS C12N-0001/15; C12N-0015/81; C12N-0015/80; C12N-0015/60; C12N-0015/55;  
 C12N-0015/53; C12P-0025/00; C07D-0475/14  
 ICI C12N-0001/19, C12R-0001/85; C12N-0015/60, C12R-0001/865; C12N-0015/55,  
 C12R-0001/865; C12N-0015/53, C12R-0001/865  
 CC 7-2 (Enzymes)  
 Section cross-reference(s): 10, 17

## FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE---4238904	A1	19940526	1992DE-4238904	19921119
	CA---2149532	AA	19940526	1993CA-2149532	19931112
	WO---9411515	A1	19940526	1993WO-EP03183	19931112
	W: CA, JP, US				
	RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	EP---668917	A1	19950830	1994EP-0901793	19931112
	EP---668917	B1	19970507		
	R: AT, BE, CH, DE, DK, ES, FR, GB, IT, LI, NL, SE				
	JP--08502896	T2	19960402	1993JP-0511718	19931112
	AT---152769	E	19970515	1994AT-0901793	19931112
	ES---2101486	T3	19970701	1994ES-0901793	19931112
	US---6929933	B1	20050816	1997US-0989140	19971211
PRAI	1992DE-4238904	A	19921119		
	1993WO-EP03183	W	19931112		
	1995US-0403768	B1	19950324		

## CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
DE 4238904	ICM	C12N-0001/19
	ICS	C12N-0001/15; C12N-0015/81; C12N-0015/80; C12N-0015/60; C12N-0015/55; C12N-0015/53; C12P-0025/00; C07D-0475/14
	ICI	C12N-0001/19, C12R-0001/85; C12N-0015/60, C12R-0001/865; C12N-0015/55, C12R-0001/865; C12N-0015/53, C12R-0001/865
	IPCI	C12N0001-19 [ICM,5]; C12N0001-15 [ICS,5]; C12N0015-81 [ICS,5]; C12N0015-80 [ICS,5]; C12N0015-60 [ICS,5]; C12N0015-55 [ICS,5]; C12N0015-53 [ICS,5]; C12P0025-00 [ICS,5]; C07D0475-14 [ICS,5]; C12N0001-19 [ICI,5]; C12R0001-85 [ICI,5]; C12N0015-60 [ICI,5]; C12R0001-865 [ICI,5]; C12N0015-55 [ICI,5]; C12R0001-865 [ICI,5]; C12N0015-53 [ICI,5]; C12R0001-865 [ICI,5]
CA---2149532	IPCI	C12N0015-52 [ICM,6]; C12P0025-00 [ICS,6]; C12N0001-19 [ICS,6]
WO---9411515	IPCI	C12N0015-52 [ICM,5]; C12N0015-53 [ICS,5]; C12N0015-54 [ICS,5]; C12N0015-55 [ICS,5]; C12N0001-19 [ICS,5]
EP---668917	IPCI	C12N0015-52 [ICM,6]; C12N0015-53 [ICS,6]; C12N0015-54 [ICS,6]; C12N0015-55 [ICS,6]; C12N0001-19 [ICS,6]
JP--08502896	IPCI	C12N0015-09 [ICM,6]; C12N0001-21 [ICS,6]; C12N0005-10 [ICS,6]
AT---152769	IPCI	C12N0015-52 [ICM,6]; C12N0015-53 [ICS,6]; C12N0015-54 [ICS,6]; C12N0015-55 [ICS,6]; C12N0001-19 [ICS,6]
ES---2101486	IPCI	C12N0015-52 [ICM,6]; C12N0015-53 [ICS,6]; C12N0015-54 [ICS,6]; C12N0015-55 [ICS,6]; C12N0001-19 [ICS,6]
US---6929933	IPCI	C12P0017-18 [ICM,7]
	NCL	435/119.000

AB The genes for the enzymes of riboflavin biosynthesis of *Saccharomyces cerevisiae* are cloned for use in the fermentation of riboflavin. The genes were cloned by complementation of rib auxotrophs of yeast.

ST riboflavin biosynthesis gene *Saccharomyces* cloning

IT Protein sequences

(of enzymes of riboflavin biosynthesis of *Saccharomyces cerevisiae*)

IT Deoxyribonucleic acid sequences

(of rib genes of *Saccharomyces cerevisiae*)

IT Gene, microbial

RL: BIOL (Biological study)  
 (rib3, of *Saccharomyces cerevisiae*, cloning of, riboflavin fermentation in relation to)

IT Gene, microbial  
 RL: BIOL (Biological study)  
 (rib4, of *Saccharomyces cerevisiae*, cloning of, riboflavin fermentation in relation to)

IT Gene, microbial  
 RL: BIOL (Biological study)  
 (rib7, of *Saccharomyces cerevisiae*, cloning of, riboflavin fermentation in relation to)

IT *Saccharomyces cerevisiae*  
 (riboflavin biosynthetic genes of cloning of, riboflavin fermentation in relation to)

IT Gene, microbial  
 RL: BIOL (Biological study)  
 (RIB1, of *Saccharomyces cerevisiae*, cloning of, riboflavin fermentation in relation to)

IT Gene, microbial  
 RL: BIOL (Biological study)  
 (RIB5, of *Saccharomyces cerevisiae*, cloning of, riboflavin fermentation in relation to)

IT Gene, microbial  
 RL: BIOL (Biological study)  
 (rib2, of *Saccharomyces cerevisiae*, cloning of, riboflavin fermentation in relation to)

IT Enzymes  
 RL: BIOL (Biological study)  
 (riboflavin-forming, genes for, cloning of, of *Saccharomyces cerevisiae*)

IT 148325-34-2, Protein (*Saccharomyces cerevisiae* gene YBR12.03 reduced)  
 152989-39-4 157243-86-2 157243-88-4  
 RL: BIOL (Biological study)  
 (amino acid sequence of and cloning of gene for)

IT 83-88-5, Riboflavin, preparation  
 RL: BIOL (Biological study)  
 (biosynthesis of, genes for, cloning of, of *Saccharomyces cerevisiae*)

IT 9075-82-5, Riboflavin synthase 56214-35-8, GTP  
 cyclohydrolase II 68651-97-8, 2,5,-Diamino-6-  
 ribosylamino-4-(3H)-pyrimidine-5-phosphate reductase 68994-19-4,  
 2,5-Diaminoribitylamino-2,4(1H,3H)-pyrimidine 5'-phosphate deaminase  
 89287-46-7, 6,7-Dimethyl-8-ribityllumazine synthase 130961-00-1,  
 L-3,4-Dihydroxy-2-butanone-4-phosphate synthase 157243-87-3  
 157243-89-5  
 RL: BIOL (Biological study)  
 (gene for, of *Saccharomyces cerevisiae*, cloning of)

IT 157243-80-6 157243-81-7 157243-82-8 157243-83-9 157243-84-0  
 157243-85-1  
 RL: PRP (Properties); BIOL (Biological study)  
 (nucleotide sequence and cloning of)

IT 157243-86-2  
 RL: BIOL (Biological study)  
 (amino acid sequence of and cloning of gene for)

RN 157243-86-2 HCAPLUS

CN Hydrolase, guanosine triphosphate cyclo-, II (*Saccharomyces cerevisiae*  
 clone pJR301 gene RIB1 reduced) (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

IT 56214-35-8, GTP cyclohydrolase II  
 RL: BIOL (Biological study)  
 (gene for, of *Saccharomyces cerevisiae*, cloning of)

RN 56214-35-8 HCAPLUS

CN Hydrolase, guanosine triphosphate cyclo-, II (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L43 ANSWER 6 OF 6 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 1986:65574 HCAPLUS  
DN 104:65574  
ED Entered STN: 08 Mar 1986  
TI The origin of ribityl side chain of riboflavin in *Ashbya gossypii*  
AU Choi, Won Ja; Yim, Jeongbin  
CS Dep. Microbiol., Seoul Natl. Univ., Seoul, 151, S. Korea  
SO Misaengmul Hakhoechi (1985), 23(3), 167-71  
CODEN: MIHCAR; ISSN: 0440-2413  
DT Journal  
LA English  
CC 10-2 (Microbial Biochemistry)  
AB In order to investigate the origin of the ribityl group of riboflavin and the involvement of GTP cyclohydrolase II in the riboflavin pathway, the incorporation of <sup>14</sup>C-labeled guanosine was studied using a well known riboflavin overproducer, *A. gossypii*. Cells were grown in a media containing (U-<sup>14</sup>C)guanosine and riboflavin and GMP were isolated and purified by column chromatog. The isolated compds., riboflavin and GMP, were labeled in the ribityl and ribosyl side chain and the isoalloxazine and guanine moiety. By comparing the specific radioactivity of each compound, it was evident that the ribose of guanosine is converted directly to the ribityl moiety of riboflavin. Apparently, biosynthesis of the vitamin begins at the level of a guanosine compound and GTP cyclohydrolase II is involved in 1 of the early steps in the biosynthetic pathway.  
ST *Ashbya* riboflavin formation ribityl side chain  
IT *Nematospora gossypii*  
(riboflavin formation by, ribityl side chain origin in)  
IT 83-88-5, biological studies  
RL: FORM (Formation, nonpreparative)  
(formation of, by *Ashbya gossypii*, ribityl side chain origin in)  
IT 85-32-5 118-00-3, biological studies  
RL: BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)  
(metabolism of, by *Ashbya gossypii* to ribityl side chain of riboflavin)  
IT 56214-35-8  
RL: BIOL (Biological study)  
(of *Ashbya gossypii*, riboflavin biosynthesis in relation to)  
IT 56214-35-8  
RL: BIOL (Biological study)  
(of *Ashbya gossypii*, riboflavin biosynthesis in relation to)  
RN 56214-35-8 HCAPLUS  
CN Hydrolase, guanosine triphosphate cyclo-, II (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

=> => b wpix

FILE 'WPIX' ENTERED AT 12:13:00 ON 20 JAN 2006  
COPYRIGHT (C) 2006 THE THOMSON CORPORATION

FILE LAST UPDATED: 16 JAN 2006 <20060116/UP>  
MOST RECENT DERWENT UPDATE: 200604 <200604/DW>  
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

>>> FOR A COPY OF THE DERWENT WORLD PATENTS INDEX STN USER GUIDE,  
PLEASE VISIT:  
[http://www.stn-international.de/training\\_center/patents/stn\\_guide.pdf](http://www.stn-international.de/training_center/patents/stn_guide.pdf) <<<

>>> FOR DETAILS OF THE PATENTS COVERED IN CURRENT UPDATES, SEE  
<http://scientific.thomson.com/support/patents/coverage/latestupdates/>

>>> FOR INFORMATION ON ALL DERWENT WORLD PATENTS INDEX USER  
GUIDES, PLEASE VISIT:  
<http://scientific.thomson.com/support/products/dwpi/>



>>> FAST-ALERTING ACCESS TO NEWLY-PUBLISHED PATENT  
DOCUMENTATION NOW AVAILABLE IN DERWENT WORLD PATENTS INDEX  
FIRST VIEW - FILE WPIFV.  
FOR FURTHER DETAILS:

<http://scientific.thomson.com/support/products/dwpifv/>

>>> THE CPI AND EPI MANUAL CODES WILL BE REVISED FROM UPDATE 200601.  
PLEASE CHECK:

<http://scientific.thomson.com/support/patents/dwpieref/reftools/classification>

>>> PLEASE BE AWARE OF THE NEW IPC REFORM IN 2006, SEE  
[http://www.stn-international.de/stdatabases/details/ipc\\_reform.html](http://www.stn-international.de/stdatabases/details/ipc_reform.html) and  
<http://scientific.thomson.com/media/scpdf/ipcrdwpf.pdf> <<<  
'BIX' IS DEFAULT SEARCH FIELD FOR 'WPIX' FILE

=> d all abex tech 179 tot

L79 ANSWER 1 OF 2 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN  
AN 2004-315573 [29] WPIX  
DNN N2004-251464 DNC C2004-119604  
TI Identifying anti-fungal agents, for use as fungicides comprises selecting  
candidate compounds which reduce or block the activity, or inhibit or  
decrease transcription, translation or expression of fungal GTP  
cyclohydrolase II.  
DC C07 D16 S03  
IN ALTHOFER, H; FREUND, A; KAESLER, B; KAROS, M; LACOUR, T; ROHL, F;  
ALTHOEFER, H; ROEHL, F  
PA (BADI) BASF AG; (ALTH-I) ALTHOFER H; (FREU-I) FREUND A; (KAES-I) KAESLER  
B; (KARO-I) KAROS M; (LACO-I) LACOUR T; (ROHL-I) ROHL F  
CYC 105  
PI WO--2004022776 A2 20040318 (200429)\* EN 43 C12Q-001-34  
RW: AT BE BG CH CY CZ DE DK EA EE ES FI FR GB GH GM GR HU IE IT KE LS  
LU MC MW MZ NL OA PT RO SD SE SI SK SL SZ TR TZ UG ZM ZW  
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK  
DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR  
KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NI NO NZ OM PG PH  
PL PT RO RU SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG US UZ VC VN  
YU ZA ZM ZW  
AU--2003270098 A1 20040329 (200459) C12Q-001-34  
EP-----1537233 A2 20050608 (200537) EN C12Q-001-34  
R: AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LT LU LV  
MC MK NL PT RO SE SI SK TR  
US--2005239159 A1 20051027 (200571) C12Q-001-42  
ADT WO--2004022776 A2 2003WO-EP009369 20030823; AU--2003270098 A1  
2003AU-0270098 20030823; EP-----1537233 A2 2003EP-0750433 20030823,  
2003WO-EP09369 20030823; US--2005239159 A1 2003WO-EP09369 20030823,  
2005US-0526207 20050304  
FDT AU--2003270098 A1 Based on WO--2004022776; EP-----1537233 A2 Based on  
WO--2004022776  
PRAI 2002EP-0020051 20020906  
IC ICM C12Q-001-34; C12Q-001-42  
ICS C12N-015-04; C12N-015-52; C12Q-001-32  
AB WO2004022776 A UPAB: 20040505  
NOVELTY - Identifying anti-fungal agents comprises selecting a candidate  
compound which reduces or blocks the activity, or inhibits or decreases  
transcription, translation or expression of the fungal GTP  
cyclohydrolase II.  
DETAILED DESCRIPTION - The method comprises:  
(a) incubating with at least one candidate compound a fungal  
GTP cyclohydrolase II polypeptide to allow the  
binding of the candidate compound to the fungal GTP  
cyclohydrolase II; and  
(b) selecting at least one candidate compound which binds to the  
fungal GTP cyclohydrolase II; or  
(c) selecting at least one candidate compound which reduces or blocks  
the activity of the fungal GTP cyclohydrolase

II; or

(d) selecting at least one candidate compound which inhibits or decreases transcription, translation or expression of the fungal GTP cyclohydrolase II.

INDEPENDENT CLAIMS are also included for the following:

(1) a nucleic acid sequence comprising: (a) a sequence comprising 582 bp (SEQ ID NO. 4); or (b) a nucleic acid sequence which can be deduced from the amino acid sequence comprising 194 amino acids (SEQ ID NO. 5) by back translation; or (c) a nucleic acid sequence which can be deduced from a functional equivalent of SEQ ID NO. 5, which has at least 66% sequence identity to SEQ ID NO. 2, by back translation;

(2) a method for determination of GTP cyclohydrolase I or II activity;

(3) a method for identification of inhibitors of GTP cyclohydrolase I or II;

(4) an antifungal identified by the methods above;

(5) a process for the preparation of a fungicidal composition; and

(6) a method for controlling harmful fungi.

ACTIVITY - Fungicide.

MECHANISM OF ACTION - GTP cyclohydrolase I or II inhibitor; Gene therapy..

USE - The compounds are useful for producing drugs. The fungal GTP cyclohydrolase II is useful as a target for the identification of antifungal agents (all claimed). The method is useful for identifying anti-fungal agents. The compounds identified are useful as fungicides.

Dwg.0/1

FS CPI EPI

FA AB; DCN

MC CPI: C04-B03B; C04-E01; C04-E03E; C04-F09; C04-F0900E; C04-L05; C10-C04E; C11-C07B2; C11-C08E; C11-C08E3; C11-C10A; C12-K04E; C14-A04; C14-D07; C14-S03; D05-H09; D05-H12  
EPI: S03-E14H

ABEX UPTX: 20040505

ADMINISTRATION - Dosage is 0.5-50 mg/kg body weight. Administration can be orally or parenterally (subcutaneously, intravenously, intramuscularly and intraperitoneally).

EXAMPLE - No relevant example given.

TECH UPTX: 20040505

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Method: The fungal

GTP cyclohydrolase II is encoded by a nucleic acid sequence comprising:

(a) a sequence comprising 903 bp (SEQ ID NO. 1);

(b) a nucleic acid sequence which can be deduced from a functional equivalent of an amino acid sequence comprising 301 amino acids (SEQ ID NO. 2) by back translation; or

(c) a nucleic acid sequence which can be deduced from a functional equivalent of SEQ ID NO. 2, which has at least 49% sequence identity to SEQ ID NO. 2, by back translation.

The method comprises testing the candidate compound in a fungal

GTP cyclohydrolase II inhibition assay. The

method comprises incubating with a candidate compound, a fungal

GTP cyclohydrolase II in a cell free system

and selecting a candidate compound which decreases the activity of the

fungal GTP cyclohydrolase II. The enzymatic

activity of the fungal GTP cyclohydrolase II

is determined in comparison to the activity of a fungal GTP

cyclohydrolase II not incubated with the candidate

compound. Determining GTP cyclohydrolase I or

II activity comprises adding GTP or GTP

analog, NAD<sup>+</sup> and formate dehydrogenase to a sample comprising GTP

cyclohydrolase II or I and determining the

NAPH content. Identifying inhibitors of GTP

cyclohydrolase I or II comprises:

(a) adding GTP or GTP analog, NAD<sup>+</sup> and formate

dehydrogenase to a sample comprising GTP cyclohydrolase I or II;

(b) adding formate, NAD<sup>+</sup> and formate dehydrogenase to a second sample comprising GTP cyclohydrolase I or II;

(c) adding to the samples a candidate compound;

(d) determining the activity of both samples; and

(e) selecting candidate compounds that show inhibition in the presence of GTP and no inhibition in the presence of formic acid.

Inhibitors of fungal GTP cyclohydrolase II

are identified in an inhibition assay. The GTP is used as a substrate and the NADPH content is determined by monitoring the increase in the absorption at 340 nm. The methods above comprises:

(a) generating organisms, which following transformation with a nucleic acid sequence encoding GTP cyclohydrolase II

are capable of over-expressing polypeptide with GTP

cyclohydrolase II activity;

(b) applying to the organism and to an analogous, untransformed organism, of a candidate compound;

(c) determining the growth, viability or infectivity of the transgenic and untransformed organism following application of the substance; and

(d) selecting candidate compounds, which reduces growth, viability or infectivity of the transgenic and untransformed fungi following application of the substance.

The organism is a fungus and the substances are identified in a high-throughput screening. The antifungal agent identified is applied to a phytopathogenic fungus in order to verify the fungicidal activity.

Preparing a fungicidal composition comprises identifying an antifungal agent and formulating the antifungal agent or an agriculturally useful salt of the active ingredient identified, with a suitable adjuvant.

Alternatively, preparing a pharmaceutical fungicidal composition comprises identifying an antifungal agent and formulating the antifungal agent or a pharmaceutical salt of the active ingredient identified, with suitable excipients. Controlling harmful fungi comprises treating the fungi or the materials, plants, soils or seeds to be protected from fungal infection, with an amount of a fungicidal compound or a fungicidal composition.

L79 ANSWER 2 OF 2 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN

AN 2000-432519 [38] WPIX

DNC C2000-131621

TI Methods to find inhibitors of riboflavin biosynthesis, DNA encoding GTP-cyclohydrolase II or 3,4-dihydroxy-2-butanone-4-phosphate synthase and related bifunctional proteins.

DC B04 C06 C07 D16

IN BACHER, A; HERZ, S

PA (BACH-I) BACHER A

CYC 91

PI DE---19942174 A1 20000621 (200038)\* 32 C12N-009-00

WO---200040744 A1 20000713 (200040) EN C12Q-001-34

RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL  
OA PT SD SE SL SZ TZ UG ZW

W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES  
FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS  
LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL  
TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW

AU---200019795 A 20000724 (200052) C12Q-001-34

EP-----1141381 A1 20011010 (200167) EN C12Q-001-34

R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT  
RO SE SI

JP--2002534094 W 20021015 (200282) 76 C12N-015-09

ADT DE---19942174 A1 1999DE-1042174 19990903; WO---200040744 A1

1999WO-EP009936 19991214; AU---200019795 A 2000AU-0019795 19991214;

EP-----1141381 A1 1999EP-0963535 19991214, 1999WO-EP009936 19991214;

JP--2002534094 W 1999WO-EP009936 19991214, 2000JP-0592437 19991214

FDT AU---200019795 A Based on WO---200040744; EP-----1141381 A1 Based on

WO---200040744; JP--2002534094 W Based on WO---200040744

PRAI 1998DE-1057868 19981215

IC ICM C12N-009-00; C12N-015-09; C12Q-001-34  
ICS C12N-009-14; C12N-009-78; C12N-009-99; C12Q-001-25; G01N-033-15;  
G01N-033-50

AB DE 19942174 A UPAB: 20000811

NOVELTY - Identifying inhibitors of GTP-cyclohydrolase

II and GTP (I) or 3,4-dihydroxy-2-butanone-4-phosphate synthase (II), comprising comparing concentrations of 2,5-diamino-6-ribosylamino-2,4(1H,3H)-pyrimidindion-5'-phosphate or 3,4-dihydroxy-2-butanone-4-phosphate before and after test compound addition to a mixture of (I) or (II) and ribulose-5-phosphate.

DETAILED DESCRIPTION - Screening for presence or absence of inhibition of GTP-cyclohydrolase II activity, comprises the following steps:

(a) production of a first aqueous mixture with a content of a protein with a GTP-cyclohydrolase II sequence and GTP;

(b) transforming the first mixture in question during a predefined time at a predefined temperature and determining the concentration of 2,5-diamino-6-ribosylamino-2,4(1H,3H)-pyrimidindion-5'-phosphate (A);

(c) producing a second aqueous mixture by addition of a predetermined quantity of a chemical test sample to the first mixture;

(d) transforming the second mixture during a predetermined time at a predefined temperature and determining the concentration of (A); and

(e) determining the presence of inhibition of GTP-cyclohydrolase II by establishing if the determined concentration in step (d) is lower than that in step (b).

INDEPENDENT CLAIMS are also included for the following:

(1) a reagent systems for use in the novel method;

(2) an isolated protein with plant enzyme sequence and function of GTP-cyclohydrolase II and/or 3,4-dihydroxy-2-butanone-4-phosphate synthase;

(3) isolated DNA, which codes a protein of (2), and optionally at least one other enzyme of the riboflavin biosynthesis pathway;

(4) a vector containing a nucleotide sequence for DNA of (3);

(5) a method to inhibit enzymes with GTP-cyclohydrolase II and 3,4-dihydroxy-2-butanone-4-phosphate synthase activity for, or in, a plant through treatment with a compound, which is chosen from the group of chemical compounds, which show inhibition in the novel method; and

(6) a method to inhibit an enzyme with GTP-cyclohydrolase II or 3,4-dihydroxy-2-butanone-4-phosphate synthase activity from, or in, a microorganism through treatment with a compound, which is chosen from the group of chemical compounds, which show inhibition in the novel method.

USE - The methods can be used to screen for the presence or absence of inhibitors of GTP-cyclohydrolase II activity, especially specific inhibitors of mutated, plant-like GTP-cyclohydrolase II or 3,4-dihydroxy-2-butanone-4-phosphate synthase. These enzymes are involved in riboflavin biosynthesis. The inhibitors are useful as herbicides, fungicides or as antibacterial agents.

Dwg.0/5

FS CPI

FA AB; DCN

MC CPI: B04-C01G; B04-E02E; B04-E03E; B04-E08; B04-L05; B04-L06; B04-M01; B04-N04A; B11-C08; B11-C08E3; B12-K04; B12-K04E; B14-A01; B14-A04; B14-D07; B14-D08; C04-C01G; C04-E02E; C04-E03E; C04-E08; C04-L05; C04-L06; C04-M01; C04-N04A; C11-C08; C11-C08E3; C12-K04E; C14-A01; C14-A04; C14-D07; C14-D08; C14-V01; D05-C03C; D05-C03G; D05-H08; D05-H09; D05-H12; D05-H12A; D05-H12E; D05-H17A3; D05-H17B3

ABEX UPTX: 20000811

SPECIFIC SEQUENCES - A bifunctional GTP-cyclohydrolase

II/3,4-dihydroxy-2-butanone-4-phosphate synthase was isolated from Arabidopsis thaliana having a 543 residue amino acids sequence, encoded by a 1632 base pair sequence, and Lycopersicon esculentum, having a 552 residue amino acid sequence, encoded by a 1659 base pair sequence, all

sequences are given in the specification.

TECH UPTX: 20000811

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Method: The aqueous mixture contains a 2+ metal ion, especially magnesium. The mixture contains an anti-oxidative substance. It has a pH in the region of 6-9.5. A premixture is made, in which the essential ingredients are missing, and the reaction is started through the addition of these ingredients. The concentration of (A) or (II) can be directly detected or after chemical or enzymatic derivatization. The direct detection is carried out after the reaction is finished by addition of a chelating agent for the 2+ metal ion. Chemical derivatization of (A) is carried out through the addition of preferably diacetyl. Alternatively, for enzymatic determination, 2,5-diamino-6-ribosylamino-4(3H)-pyrimidion-5-phosphoreductase and NADP(H) are added and NAD(P) is detected. (II) is chemically derived with an aromatic or heteroaromatic ortho-diamine. Alternatively for enzymatic derivatization, 6,7-dimethyl-8-ribityl-lumazin synthase and 5-amino-6-ribitylamino-2,4(1H,3H)-pyrimidion are added and the concentration of riboflavin is determined.

=> d his

(FILE 'HOME' ENTERED AT 08:45:53 ON 20 JAN 2006)

FILE 'HCAPLUS' ENTERED AT 08:47:18 ON 20 JAN 2006

L1 1 US2005239159/PN OR (US2005-526207# OR EPO2002-20051# OR WO2003-  
L2 28673 BASF/PA,CS  
E FREUND A/AU  
L3 161 E3-8  
E FREUND ANNETTE/AU  
L4 22 E3  
E ROHL F/AU  
L5 22 E4,E6  
E ALTHOFER H/AU  
L6 5 E4  
E KAROS M/AU  
L7 14 E3-4  
E KAESLER B/AU  
L8 17 E3-4  
E LACOUR T/AU  
L9 13 E3-6  
E ROEHL F/AU  
L10 73 E3-6  
E ALTHOEFER H/AU  
L11 19 E4

FILE 'REGISTRY' ENTERED AT 09:07:22 ON 20 JAN 2006

FILE 'HCAPLUS' ENTERED AT 09:07:37 ON 20 JAN 2006

L12 TRA L1 1- RN : 11 TERMS

FILE 'REGISTRY' ENTERED AT 09:07:38 ON 20 JAN 2006

L13 11 SEA L12  
SEL RN 1-6  
L14 6 E1-6 AND L13  
L15 232 ((GTP OR GUANOSINE (1W)TRIPHOSPHATE) (L) (CYCLOHYDROLASE OR CYC  
L16 5 L15 AND L14  
L17 1 L14 NOT L16  
L18 5 L14 NOT L17  
L19 5 L16,L18  
L20 232 L15,L19

FILE 'HCAPLUS' ENTERED AT 09:13:38 ON 20 JAN 2006

L21 229 L20  
L22 98 (GTP OR GUANOSINE (1W)TRIPHOSPHATE) (L) (CYCLOHYDROLASE OR CYCL  
L23 261 L21-22

```

      E ANTIFUNG/CT
      E E5+ALL
      E E2
L24      71383 E3-25
      E E3+ALL
L25      82435 E8+OLD,NT
L26      5 L1-9 AND L23
L27      256 L23 NOT L26
L28      0 L27 AND L24-25
      E FUNGI/CT
      E E3+OLD,NT1
L29      25107 E1+OLD,NT1
      E FUNGI/CT
L30      24403 E3-102
L31      28086 FUNGI/CW
      E FUNGIA/CT
L32      40 E3-10
      E E3+ALL
L33      39 E4+NT
L34      1 L26 AND L24-25,L29-33
L35      0 L27 AND L29-33
L36      3 L27 AND FUNG?
L37      5 L27 AND L23 (L) ANT/RL
L38      5 L1,L26,L34
      E ASHBYA GOSSYPPII/CT
      E E3+ALL
L39      209 E6+OLD
      E FUSARIUM GRAMINEARUM/CT
L40      1139 E3-5
      E E3+ALL
L41      1140 E6+OLD,NT
L42      4 L23 AND L39-41
L43      6 L38,L42 AND L1-11,L21-41

```

FILE 'BIOSIS' ENTERED AT 09:55:00 ON 20 JAN 2006

```

L44      69 L23
L45      542175 (15000 OR 15100 OR 15300 OR 15500 OR 15700 OR 15900 OR 19000)/B
L46      47524 (50506 OR 50510)/CC
L47      QUE FUNGI+NT/BC OR FUNGI+NT/ORGN
L48      9 L44 AND L45-47
      E FREUND A/AU
L49      30 E3-6
      E ROHL F/AU
L50      38 E3-5
      E ROEHL F/AU
L51      27 E3-5
      E ALTHOFER H/AU
      E ALTHOEFER H/AU
L52      3 E4
      E KAROS M/AU
L53      10 E3-4
      E KAESLER B/AU
L54      4 E3-4
      E LACOUR T/AU
L55      9 E3-5
L56      2084 BASF/CS
L57      0 L44 AND L49-56
L58      0 (ANTIFUNG? OR ANTI FUNG? OR FUNGICID?) AND L44

```

FILE 'EMBASE' ENTERED AT 10:02:58 ON 20 JAN 2006

```

L59      35 L23
      E ANTIFUNG/CT
      E E5+ALL
L60      8901 E7+NT
      E ANTIFUNG/CT
      E E6+ALL

```

L61 132900 E3+NT  
 E FUNGI/CT  
 E FUNGUS/CT  
 E E3+ALL  
 L62 173097 E4+NT  
 E ASHBYA/CT  
 E FUSARIUM/CT  
 E E3+ALL  
 L63 3641 E8+NT  
 L64 4 L59 AND L60-63

FILE 'MEDLINE' ENTERED AT 10:06:43 ON 20 JAN 2006

L65 46 L23  
 E FUNGI/CT  
 E E3+ALL  
 L66 192684 E2+NT  
 E E168+ALL  
 L67 124503 E6+NT  
 E E113+ALL  
 L68 17054 E8+NT  
 E FUNGI/CT  
 E E4+ALL  
 E FUNGI, UNCLASSIFIED/CT  
 E E3+ALL  
 L69 4 E3  
 L70 53690 FUNGI OR FUNGUS OR FUNGIA  
 L71 8 L65 AND L66-70

FILE 'WPIX' ENTERED AT 10:10:42 ON 20 JAN 2006

L72 19 L22  
 L73 1 (EC OR E C) () (3 5 4 25)  
 SEL AN 3 12 L72  
 L74 2 E1-2 AND L72  
 E GTP CYCLOHYDR/CN  
 L75 1 E7  
 E GUANOSINE TRIPHOSPHATE CYCLO/CN  
 E FUNGAL GTP/CN  
 E FUNGAL GUANOSINE/CN  
 SEL SDCN L75  
 EDIT /SDCN /DCN  
 L76 2 E1/DCN  
 SEL DCSE L75  
 EDIT /DCSE /DCRE  
 L77 2 E2/DCRE  
 L78 19 L72,L73,L76-77  
 L79 2 L78 AND L74

=>